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Clinical Assisted Reproduction

Psychological Evaluation Test After the Use of Assisted Reproduction Techniques

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***Purpose*:** The emotional changes provoked by the use of assisted reproduction techniques (ART) may trigger important psychological reactions. The objective of the present study was to develop a psychological evaluation test (PET–ART) in order to identify the occurrence of psychological problems and to facilitate their treatment.

***Methods*:** A total of 128 women were submitted to PET–ART of the Center for Human Reproduction, "Sinhá Junqueira" Maternity Foundation, after application of IVF/ICSI program at least once. The causes of infertility were male-related in 45% of cases, female-related in 48%, and both male- and female-related in 7%. Infertility was primary in 79% of cases and secondary in 21%. The mean age of the women was 34.5 ± 5.2 years and the mean age of the men was 37.9 ± 6.8 years. The PET–ART was evaluated using a questionnaire with 15 questions selected in order to detect emotional reactions caused by infertility. The responses were assigned four grades with respect to intensity (1 = *mild intensity*; 2 = *medium intensity*; 3 = *high intensity*; and 4 = *maximum or unbearable intensity*). The sum of the responses corresponded to PET–ART score ranging from 15 to 60 points. The reliability of the questionnaire was evaluated by the alpha coefficient of Cronbach.

***Results*:** The PET–ART identified five questions receiving 50% or more responses of the high/maximum intensity type (sum of the percentages of responses with a score of 3 and 4). The questions were the following: 1—The waiting time before being submitted to a pregnancy test (82.8% of the patients); 2—A negative result of the pregnancy test (77.3% of the patients); 3—The degree of anxiety in a new attempt to obtain pregnancy (76.5% of the patients); 4—Finding the money necessary for the repetition of the IVF/ICSI techniques (66.4% of the patients); 5—The possibility of collecting few eggs, or of forming or not an embryo in the laboratory is an expectation that makes me anxious (57.8% of the patients). The mean PET–ART was 33 ± 6. The alpha coefficient of Cronbach was 0.757.

***Conclusions*:** The PET–ART was an efficient tool for the identification of women with emotional changes provoked by the application of ART and for the planning of their treatment. However, a general psychological approach was developed for each emotional factor regardless of PET–ART.

KEY WORDS: Assisted reproduction; ICSI; IVF; psychological evaluation; test.

INTRODUCTION

Assisted reproduction techniques (ART) have expanded the opportunities for the treatment of infertility and have led to changes in the psychological profile of couples. For many couples, ART is the last chance

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of having a child which generally occurs after many months and, sometimes, years of treatment failure, frequently accompanied by high physical, emotional, and financial costs.

The nature of the sophisticated technology involving ART creates a stressful atmosphere, considering the high costs and relatively low chances of success. ART is a "game" and, as gamblers, patients may have high expectations success, or feel compelled to try "only once more," believing that it is difficult to terminate treatment without success.

Furthermore, among all infertility treatments, in vitro fertilization (IVF) is considered to be the most stressful (1), with 80% of IVF patients being moderately to extremely stressed (2).

In addition, most couples report acute depression after failure of a cycle (3), with elevated anxiety and irritation that lasts for weeks (4). Despite the stressful consequences of infertility and ART, several studies have reported that most patients are generally well adjusted (5). However, most studies on stress during ART have been conducted on women who, in general, react more intensely to infertility and ART than men (6). Women reported greater anxiety and depression than their partners before IVF (6). During IVF, ultrasound monitoring, blood collection for hormone measurement, injections, invasive procedures for egg collection, and embryo transfer are generally reported by the patients as causes of stress (7). If treatment fails, depression persists for a longer period of time in women than in men, lasting more than 6 months (4).

Although general considerations can be made about the stress level during ART, the experience of the patient with infertility is personal and unique, with each patient reacting differently to stress based on her personality and life experience. Newton *et al.* (8) noted that stress has been regarded as both a stimulus or event (circumstances external to the patient), or as a response (internal disturbance). The aspects of ART that are stressful to the patient are multifaceted and affect all parts of her life: marital, social, physical, emotional, and religious. The time aspect is stressful both in terms of the duration of treatment, which leads to an interruption in occupational, family and social activities, and in terms of the prolonged waiting periods between IVF attempts.

In addition, marital relationships are affected by the removal of the conjugal act for procreation, resulting in the loss of sexual intimacy of the couple. Side effects of the medications such as heat waves and headaches, changes in mood and decisions about the number of transferred embryos are also considered to be stress factors. During a treatment cycle, patients visualize ART as a series of steps that need to be successfully completed before moving to the next phase, i.e., ovulation monitoring, egg collection, fertilization, embryo transfer, a waiting period of 12–14 days to receive the result and, finally, the pregnancy test. The levels of stress and anxiety vary with each step, reaching a peak during the period of waiting for the result.

Because of the emotional consequences of infertility and the stressful nature of ART, it is clear that patients require psychological support as part of the medical treatment process, and it is the responsibility of all members of the human reproduction team to provide this support (9). Interactions with each member of the team, from the administrative clerk to the physician, influence the perception of the patient concerning the care provided, thus modifying her stress level.

Based on these considerations, the Center for Human Reproduction, "Sinhá Junqueira" Maternity Foundation, Ribeirão Preto, Brazil, started a study aiming at the establishment of a psychological evaluation test (IPE–ART) in patients who underwent ART at least once.

MATERIAL AND METHODS

A total of 128 women were submitted to a PET–ART at the Center for Human Reproduction, "Sinhá Junqueira" Maternity Foundation, after at least one application of ART. The causes of infertility in this population were male-related in 45% of cases, female-related in 48%, and both female- and male-related in 7%. Infertility was primary in 79% of cases and secondary in 21%. The mean age of the women was 34.5 ± 5.2 years and the mean age of the men was 37.9 ± 6.8 years.

The PET–ART was based on a questionnaire with 15 questions selected in order to identify emotional reactions caused by psychological problems in infertile women submitted to at least one application of ART. The responses were assigned four grades with respect to intensity (1 = *mild intensity*; 2 = *medium intensity*; 3 = *high intensity*; and 4 = *maximum or unbearable intensity*). The sum of the responses to each question (Grades 1–4) corresponded to a PET–ART score ranging from 15 to 60 points.

The questionnaires were routinely distributed and answered by the patients on the occasion of the first ultrasonographic examination of the IVF/ICSI

program. The reliability of the questionnaire was evaluated by Cronbach's alpha coefficient.

RESULTS

Table I shows the responses of the female population to the questions composing the PET–ART. Analysis of the index identified responses of the high/maximum type (sum of the percentages of responses with 3 and 4 points) in infertile patients at the following frequency:

Table I. PET–ART of Patients Submitted to IVF/ICSI Techniques at Least Once

	1	2	3	4
1. I was sad after receiving the negative result of the pregnancy test	4	25	58	41
2. After a negative pregnancy test I noticed that the degree of participation of the medical team in the failure of this fact may be quantified in this item	82	30	14	2
3. The intensity of concern provoked by the injections was	63	42	18	5
4. The fear of performing anesthesia	59	42	24	3
5. Finding the money necessary for the repetition of the IVF/ICSI techniques produced a degree of concern	12	31	50	35
6. I believe that psychological support will help my performance in the IVF/ICSI program at an intensity	32	36	49	11
7. The waiting time before being submitted to a pregnancy test makes me anxious	5	17	61	45
8. My experience in obtaining pregnancy makes me anxious in a new attempt of IVF/ICSI	8	22	63	35
9. The fact of having excess embryos which will be kept in the laboratory for an undetermined period of time causes a degree of anxiety	64	38	21	5
10. The possibility of having twins or triplets causes me to be stressed by the assisted reproduction treatment at an intensity	80	37	8	3
11. Does the moment of embryo transfer produce considerable concern?	26	43	41	18
12. These techniques of embryo production in the laboratory, although not causing problems in newborn children, make me anxious about the health of my future child at an intensity	71	41	13	3
13. I am often worried about the side effects of so much medication that I use to produce eggs at an intensity	31	46	40	11
14. The rest after the procedure and the fact that I cannot have sexual relations or exaggerate physical exercise for 14 days makes me anxious at an intensity	73	35	12	8
15. The possibility of collecting few eggs, or of forming embryos in the laboratory is an expectation that makes me anxious	15	39	49	25

Note. 1: *mild intensity*; 2: *medium intensity*; 3: *high intensity*; 4: *maximum or unbearable intensity.*

1. The waiting time before being submitted to the pregnancy test: 82.8% of the patients.
2. A negative result of the pregnancy test: 77.3% of the patients.
3. The degree of anxiety in a new attempt to obtain pregnancy: 76.5% of the patients.
4. Finding the money necessary for the repetition of the IVF/ICSI: 66.4% of the patients.
5. The possibility of collecting few eggs, or of forming or not an embryo in the laboratory is an expectation that makes me anxious: 57.8% of the patients.
6. I believe that psychological support will help my performance in the IVF/ICSI program: 46.8% of the patients.
7. The moment of embryo transfer produces considerable concern: 46% of the patients.
8. I am often concerned about the side effects of the numerous medications I use to produce eggs: 39.8% of the patients.
9. The fear of being submitted to anesthesia: 21% of the patients.
10. The fact of having excess embryos which will be kept in the laboratory for an undetermined period of time makes me anxious: 20.3% of the patients.
11. The degree of intensity of the concern provoked by injections is high: 17.9% of the patients.
12. The rest after the procedure and the fact that I cannot have sexual relationships or exaggerate physical exercise for 14 days make me anxious: 15.6% of the patients.
13. The techniques of embryo production in the laboratory, although not causing problems in newborn infants, make me anxious about the health of my future child: 12.5% of the patients.
14. After a negative pregnancy test I notice that the degree of participation of the medical team in the failure of the process may be quantified in this item: 12.5% of the patients.
15. The possibility of having twins or triplets causes me to be stressed with the assisted reproduction treatment: 8.5% of the patients.

The mean PEAT–ART score was 33 ± 6. Cronbach's alpha coefficient was 0.757, demonstrating

Table II. Variations in Cronbach's Alpha Coefficient for the PET–ART Questionnaire After Removal of One of the Questions

Question removed	Cronbach's alpha coefficient
1	0.734
2	0.747
3	0.742
4	0.754
5	0.739
6	0.739
7	0.735
8	0.728
9	0.757
10	0.771
11	0.730
12	0.746
13	0.738
14	0.756
15	0.734

good consistence of the questionnaire, which was also homogenous since exclusion of any question did not drastically alter the alpha value (Table II).

DISCUSSION

The PET–ART was created in order to evaluate the emotional changes caused by one or more unsuccessful applications of ART in infertile women.

The data showed that the waiting time before being submitted to a pregnancy test was the aspect that most caused anxiety in the female population (82.8% of the patients presented a high or maximum/unbearable degree of anxiety). Guidance after embryo transfer until the day of blood collection for the pregnancy test may reduce this stressful factor. In general, rest should be minimum and the patient should be encouraged to immediately resume her habitual tasks. It should be also clarified that an early pregnancy test is difficult to perform since it frequently provides false–positive results due to contamination with human chorionic gonadotrophin used for final maturation of the ovarian follicle or for maintaining the second phase itself.

The second most frequent stress situation was the degree of sadness or depression caused by the negative result of a previous pregnancy test (77.3% of the patients). The negative result is intimately connected to a feeling of loss, which may provoke an important depression. It is known that couples who plan to have children initially create a "virtual" child which already before birth participates in the life of the couple, especially in its dreams (expanding the house to receive the heir, thinking of changes in the life routine with the arrival of the future child, improving the economic situation to handle expenses with maternity, etc.). A negative result represents a loss, i.e., the death of the "virtual" child. Therefore, our group seeks to explain on the occasion of the embryo transfer the true possibility that the procedure might fail and to reassure the patient that our team will be always present in these bad moments with a word of comfort and hope and that the "fight" should be of short duration. On the other hand, we know that this mission is easier when the patient still possesses cryopreserved excess embryos which could be transferred soon. However, many pregnancy tests are carried out far from Ribeirão Preto and the result is generally communicated through a telephone call, thus impairing a perfect approach to this important factor.

One of the most important stressful factors is the lack of or difficulty in obtaining money for the repetition of ART. This factor was identified in 66.4% of Brazilian women, while it should not be a source of stress for French or German women since they can carry out at least three attempts at ART using health insurance programs supported by the government.

Technical aspects connected to ART may also be an important cause of stress. In the present study, approximately 57.8% of the women were concerned about the possibility of collecting few eggs or of forming a small number of embryos in the laboratory. Frequent discussions with the patients about the possibility of these events should be routinely held at any reproduction center, since they represent the only way of trying to reduce this stressful factor, always reminding the patient of the limitation of biological embryo culture systems. In addition, the act of embryo transfer was reported to be an important moment of stress by approximately 46% of the patients. Technical and emotional measures (the transfer room could contain something special, i.e., sound, images on the ceiling, etc.) may reduce the concerns of the patients in this situation. It has been observed on this occasion that various patients establish a clear "mother–child" relationship when visualizing the embryos on the television monitor at the time of transfer. The materialization of the "virtual" child occurs exactly at this point.

One aspect that called a great deal of attention during the analysis of the present data was the lack of concern of the patients regarding the possibility of multiple pregnancies. Only 8.6% of the patients reported this aspect to be a stressful factor. These data demonstrate that a campaign to prevent multiple

pregnancies should not only include physicians, who are in principle responsible for the choice of the ideal number of embryos to be transferred, but also the education of patients regarding the risk of multiple pregnancies, since services with poor rates in the excess embryo cryopreservation programs may easily induce patients to accept the transfer of an exaggerate number of embryos.

On the other hand, 20.3% of the patients showed a certain stress level with respect to the cryopreservation of excess embryos in the laboratory. Limiting the number of fertilized eggs might be a coherent option although it may lead to a decrease in final pregnancy rates.

In conclusion, the PET–ART was a simple and efficient tool for the identification of women with problems of stress caused by infertility after the application of ART. The team of the Center for Human Reproduction (employees, biologists, nurses, doctors, etc.) has started to use the information provided by the PET–ART in the daily routine, and patients are counseled about the factors generating stress. However, for all patients with high PET–ART score, specialized psychological evaluation were suggested immediately or soon after embryo transfer, when the patient returns to her home town.

Finally, the identification of patients with high PET–ART will permit a better understanding of the problems caused by the frustrating attempts at pregnancy after the application of ART and, mainly, the identification of psychological symptoms (anxiety, depression, aggressiveness, obsession, phobias, etc.), with immediate psychotherapy contributing to obtaining pregnancy or, at least, to a satisfactory emotional equilibrium in terms of the problem of infertility.

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